FM Workshop Panel

Integrating Fault Management: How Does It Fit?

Comments to the FM Handbook indicated differing viewpoints concerning

- Scope of FM
- Integrating FM into engineering processes
- Assigning FM roles and responsibilities

Panel is intended to start a broader community discussion

1. How does a project strike a balance between the integrated system aspects of FM and the development and delivery of the required FM flight products?
2. How does a project manage the overlapping roles and responsibilities between FM, SE, and safety and reliability?
3. How does a project allocate the responsibilities of protecting against faults, predicting future failures, and post-facto analysis?
4. To what extent should mission type: human flight vs. robotic, single mission vs. repetitive flight; deep space vs. earth orbiter; mission size, duration, and complexity drive the approach to integrating FM?

Panel Agenda

		Duration	Total Duration
Overview (Purpose, format, panel introductions)	Moderator	5 minutes	5 minutes
Panelist Viewpoints	Panelists	7 minutes, each	42 minutes
Organizational comments (format and guidelines for audience participation)	Moderator	1 minute	1 minute
Audience Participation	Participants	Comments/Questions: 2 minutes each; Panelist response to question: 1 minutes each	40 minutes
Wrap-Up (summary of issues, follow up plans for continuing discussion via web, coming to closure, incorporating into the document)	Moderator	2 minutes	2 minutes

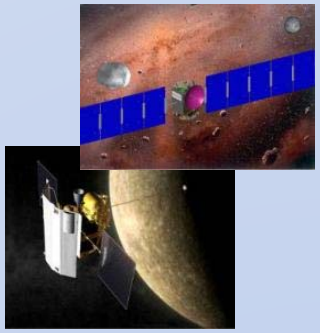
Panelists

Michael Aguilar

- Manages the software program at Goddard Space Flight Center (GSFC)
- Serves as the NASA Engineering and Safety Center (NESC) Discipline Expert in Software Engineering
- Areas of interest: software development for spacecraft C&C systems, flight simulators, submersible robotics, nuclear reactor monitoring and control systems, and safety-critical embedded software
- Masters degree in Software Engineering, Carnegie Mellon University

George Cancro

- Manager for the MPCV Avionics, Power, and Software (APS) office at JSC
- Supported a variety of positions including Shuttle and Space Station assignments, primarily in the areas of avionics and software
- Areas of interest: flight avionics, flight software and data system, flight power and wiring systems, and the ground hardware, software, and labs required to test and verify these systems



Carlos Garcia-Galan

- Deputy Manager for Mission and Systems Integration of the MPCV project
- Supported multiple ISS-Shuttle assembly missions and ISS increment operations between missions as a flight controller
- Participated in multiple IR&D projects in the areas of IVHM, Intelligent systems and Mission Management for manned spaceflight applications at Honeywell.
- Technical Lead for the System Management function on the Lockheed Martin Orion design

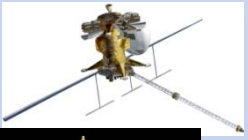
Panelists (cont.)

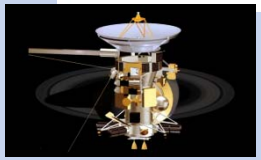
Stephen Johnson

- Associate research professor with the Center for Space Studies at the University of Colorado at Colorado Springs
- Analysis Lead for Mission and Fault Management in the Space Launch System program at MSFC
- Worked on developing practices and concepts for System Health Management and Fault Management since 1985
- General editor for *System Health Management: With Aerospace Applications* (2011)

Robert Rasmussen

- JPL Fellow, and the Architect for Europa mission studies at JPL
- Served as Chief Technologist and Chief Engineer in JPL technical divisions for software and systems engineering
- Worked Fault Management for the Voyager and led guidance and control systems engineering for Galileo and Cassini
- Doctorate in Electrical Engineering





Jonathan Wilmot

- Software architect for the Goddard core Flight Executive (cFE) and Core Flight System (CFS) software product lines
- Served in lead technical and software systems engineering roles ranging from helicopter avionics to lunar landers, including the Small Explorer series of spacecraft at NASA
- Bachelors degree in Computer Science, University of Maryland

Participant Guidelines

- We want to hear from as participants many as possible
- 2 minutes
  - Identify yourself and affiliation
  - Present question or comment
- Questions will be responded to by (optionally) all panelists; no more than 1 minute per response

Wrap-Up